What we claim is:

1. A method for generating a neural network ensemble, comprising:

training a set of individual neural networks to produce one or more output values in response to a plurality of input values, and

using a genetic algorithm having a multi-objective fitness function to select at least one ensemble, comprising a subset of the set of individual neural networks, having a desirable fitness function value.

2. A method according to Claim 1, wherein the fitness function comprises a negative error correlation objective

3. A method according to Claim 1, wherein each ensemble comprises five individual neural networks.

4. A method according to Claim 1, further comprising using the genetic algorithm to select a group of ensembles having desirable fitness function values.

5. A method according to Claim 4, further comprising testing one or more of the ensembles from the group of ensembles with data comprising actual input values and output values.

6. A method according to Claim 1, further comprising:

selecting diverse initial parameters for each member of the set of neural networks.

7. A method according to Claim 6, further comprising:

selecting a different number of hidden nodes for each member of the set of neural networks.

8. A method according to Claim 7, wherein the set of neural networks comprises thirty-two neural networks.

9. A method according to Claim 8, wherein the neural networks have from five to thirty-six hidden nodes.

10. A method according to Claim 1, further comprising:

training the individual networks with different training data.

11. A method according to Claim 10, wherein the different training data is data from different wells.

12. A method according to Claim 1, wherein the multi-objective function includes an ensemble mean squared error objective.

13. A method according to Claim 1, wherein the multi-objective function includes a sum squared weights objective.

14. A method according to Claim 1, wherein the individual neural networks are trained to produce as outputs predicted open hole logging parameters in response to inputs comprising pulsed neutron logging parameters.

15. A method according to Claim 1, further comprising normalizing the objectives of the multi-objective function.

16. A method according to Claim 1, further comprising selecting a weighting factor for each objective of the multi-objective function.

17. A method according to Claim 16, further comprising using a genetic algorithm to select the weighting factors.

18. Apparatus for producing as outputs synthetic values of at least one geophysical parameter for a well in response to inputs of actual values of geophysical parameters measured in the well, comprising a neural network ensemble selected by:

training a set of individual neural networks to produce one or more synthetic output values of at least one geophysical parameter for a well in response to a plurality of inputs of actual values of geophysical parameters measured in the well, and

using a genetic algorithm having a multi-objective fitness function to select at least one ensemble, comprising a subset of the set of individual neural networks, having a desirable fitness function value.

19. Apparatus according to Claim 18, wherein the fitness function comprises a negative error correlation objective.

20. Apparatus according to Claim 18, wherein each ensemble comprises five individual neural networks.

21. Apparatus according to Claim 18, further comprising using the genetic algorithm to select a group of ensembles having desirable fitness function values.

22. Apparatus according to Claim 21, further comprising testing one or more of the ensembles from the group of ensembles with data comprising actual input values and output values.

23. Apparatus according to Claim 18, wherein each member of the set of neural networks has diverse initial parameters.

24. Apparatus according to Claim 23 wherein each member of the set of neural networks has a different number of hidden nodes.

25. Apparatus according to Claim 24, wherein the set of neural networks comprises thirty-two neural networks.

26. Apparatus according to Claim 25, wherein the neural networks have from five to thirty-six hidden nodes.

27. Apparatus according to Claim 18, wherein the multi-objective function includes an ensemble mean squared error objective.

28. Apparatus according to Claim 18, wherein the multi-objective function includes a sum squared weights objective.

29. Apparatus according to Claim 18, wherein the individual neural networks are trained to produce as outputs predicted open hole logging parameters in response to inputs comprising pulsed neutron logging parameters.

30. Apparatus according to Claim 18, further comprising selecting a weighting factor for each objective of the multi-objective function.

31. A method according to Claim 30, further comprising using a genetic algorithm to select the weighting factors.

32. A method for producing synthetic open hole logs from actual pulsed neutron logs, comprising:

using a neural network ensemble selected from a set of individual networks by a genetic algorithm having a multi-objective function.

33. A method according to Claim 32 wherein the multi-objective function comprises a negative error correlation objective.

34. A method for generating a neural network ensemble for processing pulsed neutron well log data, comprising:

training a set of individual neural networks to produce one or more output values in response to a pulsed neutron well log input data, and

using a genetic algorithm having a multi-objective fitness function to select at least one ensemble, comprising a subset of the set of individual neural networks, having a desirable fitness function value.

35. A method according to Claim 34, wherein the fitness function comprises a negative error correlation objective.